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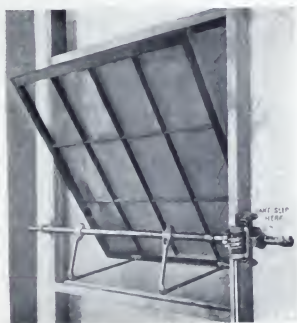


A
Catalog
Of
Sash Operating
Apparatus





CATALOGUE
of
Sash Operating Apparatus
as manufactured by
Lord & Burnham Co.



New York Office:
1133 BROADWAY

Works at
IRVINGTON-ON-HUDSON

(c 1915)

Just a few of our Installations

U. S. NAVY YARD SHOPS.

PENITENTIARY AT RICHMOND, VA.

LONG ISLAND R. R., in their Power Plants, Repair
Shops, Train Sheds, Battery Sheds, etc.

NEW YORK CENTRAL R. R.—New Power Stations.

SINGER MFG. CO. SHOPS at Elizabeth, N. J.

EATON, COLE AND BURNHAM CO.'S New Shops
at Bridgeport, Conn.

R. H. MACY AND CO.'S New Department Store in
New York.

PROVIDENT BANK AT BALTIMORE, MD.

ROMAN CATHOLIC CATHEDRAL AT RICH-
MOND, VA.

A word on The Tear-out Sheets

The tear-out sheets that follow were arranged to save you a lot of bother in writing to us about measurements and such other information as we require to give you a satisfactory answer or make an intelligent bid.

Of course, if you can send a blue print, so much the better. The bid will then be accurate.

These tear-outs apply to the usual treatments, but we are ready to take any problem. The flexibility of the system makes this possible.

The Long Run Question

Although we are constantly installing long runs with success, we strongly advise the short runs.

The operating of sections over 100 lineal feet long is receiving the veto of leading engineers all over the country, for these reasons:

Equal ventilation in all sections at all times is not practicable.

Either one part has too little or another too much.

The centre of all large shops generally demand the most ventilation, the ends the least.

Runs of moderate lengths are always under perfect individual control.

In short runs sufficient power can be easily transmitted to hold the end sash, as well as the centre ones, tightly closed, or to open them even if bound with ice, as is often the case.

The short runs do all the long runs do, and more, for they ventilate when and where it is actually wanted.

72-13381-0005



As used in L. I. R. R. Battery Sheds.



Its Installation at the
White Dental Co.s.
Factory.

Tear-out Sheet No. 1

Monitor Sash

Fill in all dimensions between arrow points of sketch.

Length of monitor? _____

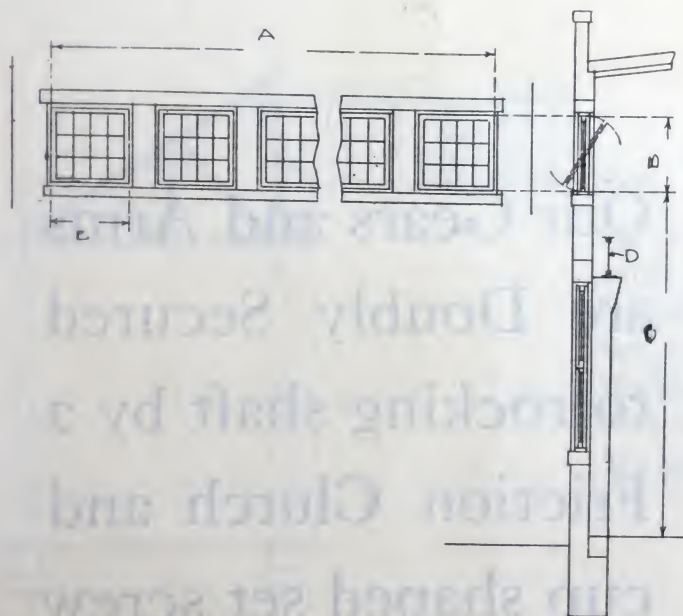
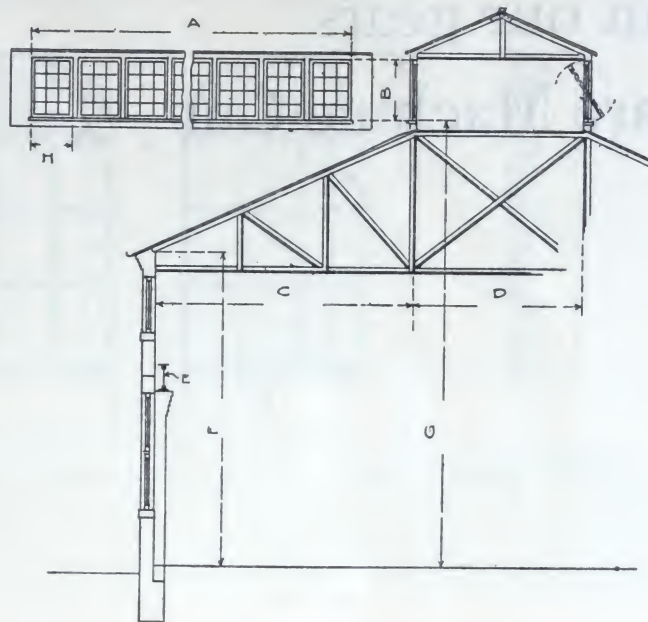
Number of sash on each side? _____

Size of sash? _____ Width? _____

Height? _____

Are sash pivoted or hinged? _____

Is there a crane rail? _____



Side Sash

Fill in all dimensions between arrow points of sketch.

Length over all sash? _____

Size of sash? _____ Width? _____

Height? _____

How many sash? _____

Are sash pivoted or hinged? _____

All the Worms
in our gears
are Machine Cut.

Our Gears and Arms
are Doubly Secured
to rocking shaft by a
Friction Clutch and
cup shaped set screw

Tear-out Sheet No. 2

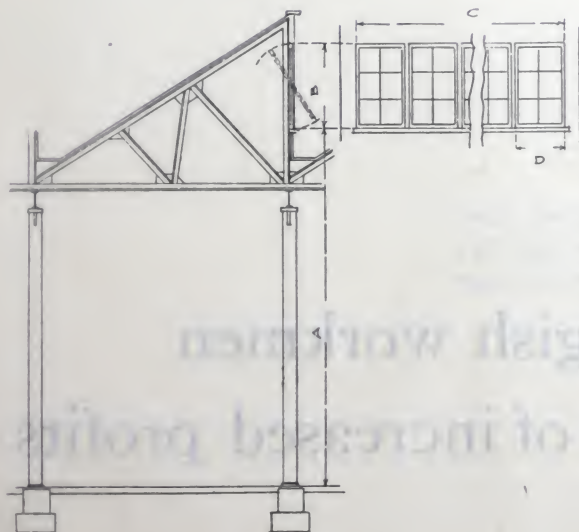
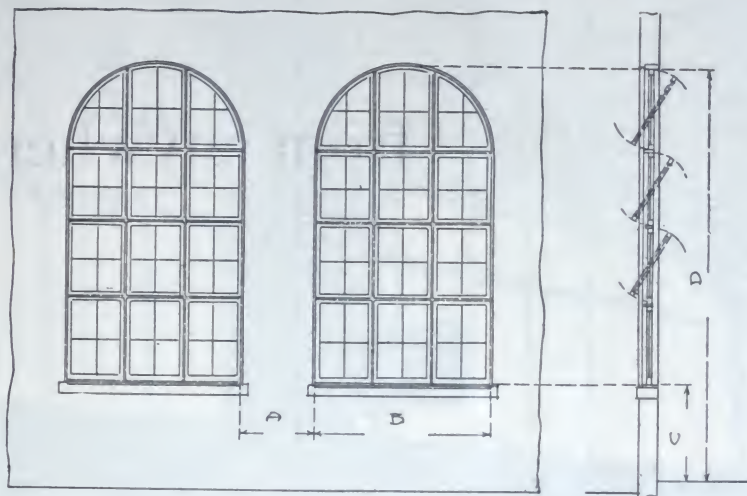
Side Frames

Fill in all dimensions between arrow points on sketch.

How many frames? _____

" " sash in each? _____

Are sash pivoted or hinged? _____



Saw Tooth

Fill in all dimensions between arrow points on sketch.

Length over all sash? _____

Size of sash? _____

Width? _____ Height? _____

How many sash? _____

Are sash pivoted or hinged? _____

Our Gears Operate

from anywhere

Any way

Any Place

Poor Air-sluggish workmen
Ventilation a matter of increased profits



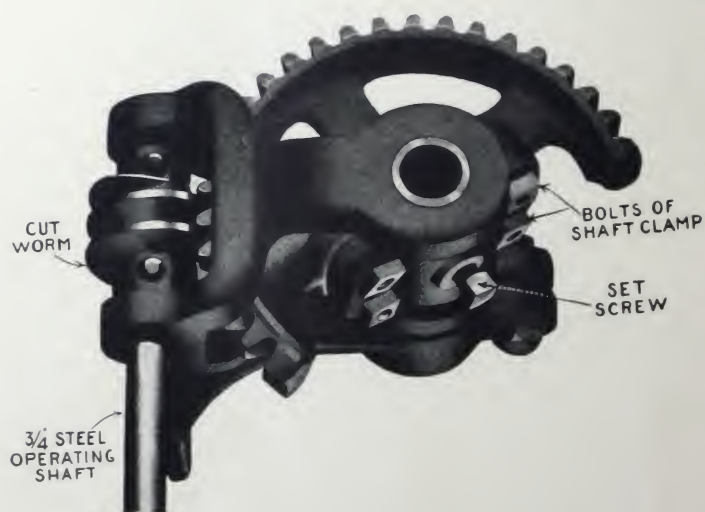
Installed in the R. H. Macy's store, New York. It goes to show how compact and inconspicuous the system really is, as well as its adaptability to conditions demanding attractive effects.

Detail showing manner of placing operating hand wheel and gear



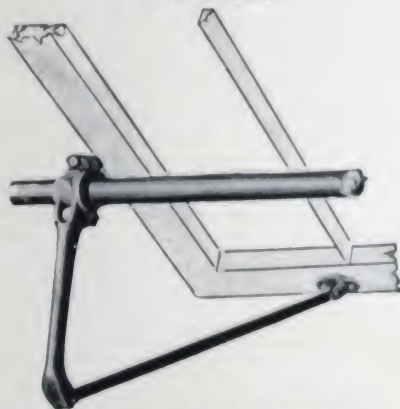


Operating Monitor Sash.
Interborough R.R. Repair Shop.





No. 1 Gear



No. 2
Shaft

No. 4 Arm and Rod



No. 9 Universal Joint



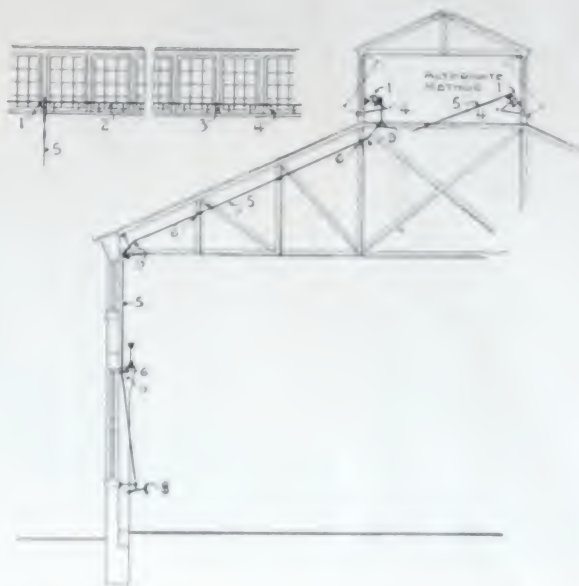
No. 6 Universal Stand



No. 3
Shaft Hanger



No. 8 Hand Wheel



For Monitors

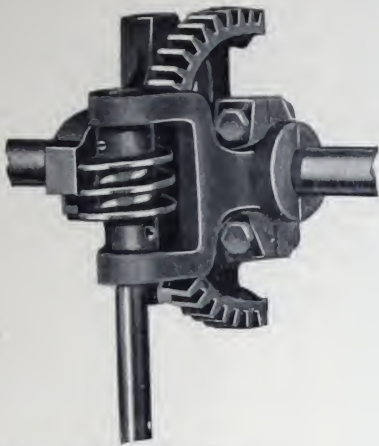
This arrangement is to show the important parts in details, each in their relative position as indicated on sketch.



Factory run of 165 ft. of sash operated
from a central joint



Machine showing our
method of cutting gear worms



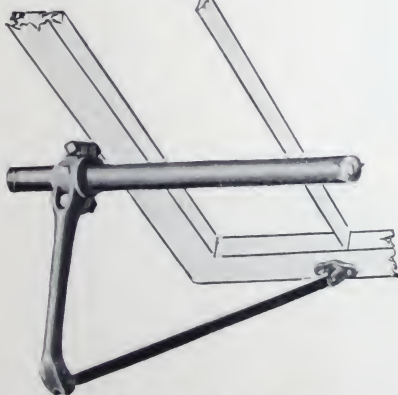
No. 1
Gear



No. 5 Operating Rod



No. 3 Shaft Hanger



No. 2
Shaft

No. 4 Arm and Rod



No. 6 Universal
Standard



No. 7 Bevel Gear



No. 8 Hand Wheel

Side Walls

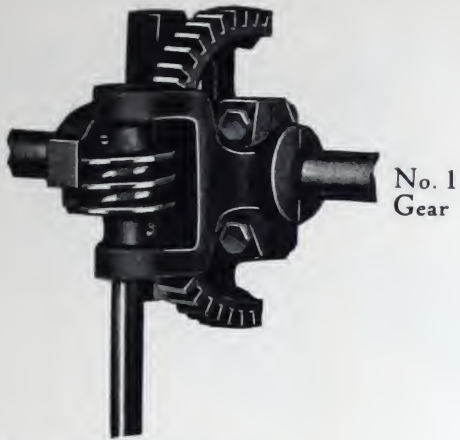
This arrangement is to show the important parts in detail, each in their relative positions as indicated on sketch.



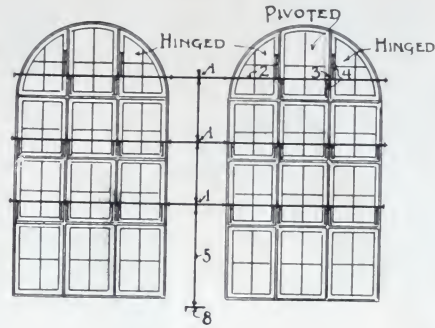
Long Island Railroad Power Plant as an example
of side frame operation



Another example of the system
installed in Richmond Prison, Va.



No. 1
Gear



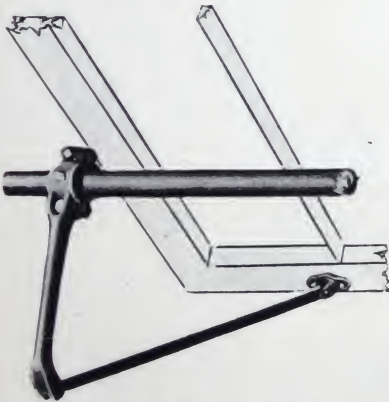
No. 5 Operating Rod



No. 3 Shaft Hanger

Sash Frames

This arrangement is to show the important parts in details, each in their relative positions as indicated on sketch.



No. 2
Shaft

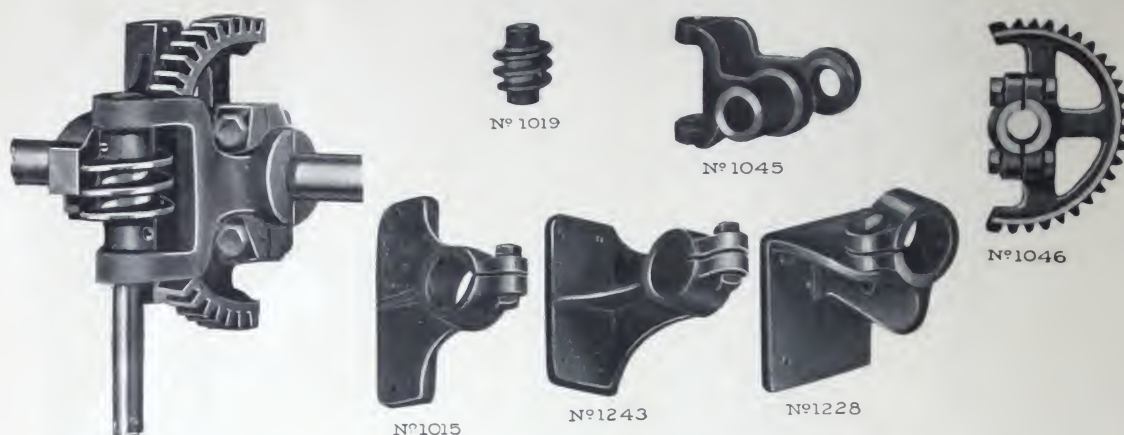
No. 4 Arm and Rod



No. 6 Universal Stand



No. 8 Hand Wheel



Gear and its Parts

All parts of the gear are made with jigs and templates and can always be renewed.

This plate shows a set of gears complete, consisting of gear wheel worm, yoke, bolting collar or bearing. The gear wheel is made in two parts to provide for easy application and adjustment. The fastenings are by means of a bolting cap provided with four bolts. When these are properly tightened and the set screw through, cap is turned tightly against pipe. It provides a combination friction and set-screw fastening which is capable of holding the gear securely, under almost any load.

There are also shown the separate parts of the gear: No. 1046, the gear wheel; No. 1045, the yoke, provided with turned sleeve at end to fit in bolting collar; No. 1019, the cut worm; No. 1015, the bolting collar to fasten on side of post; No. 1243, the bolting collar to fasten on face of mullion; No. 1228, the bolting collar to fasten on end wall. These collars are all made with the same means for holding sleeve of yoke as that used in fastening gear wheel. This allows placing the yoke at any angle, and at the same time holds it rigid when the bolts are tightened. The gears are made in two sizes:

Complete, including either style of collar, set 8", \$5.50; set 12", \$6.50.

Another Gear and about Slipping Points

There is a limit to the strain up to which a friction clamp and set screw in a gear will hold a round shafting. We know just what that limit is. Before it is reached we use a square shafting in place of the round. This square shaft, passing through a corresponding opening in the gear, absolutely prevents any possible slipping. The couplings are arranged to take the usual round pipe line shafts.

In case of any part breaking, by simply removing the couplings at end of square steel, the gear can be removed and any part renewed, without disturbing the line shaft.





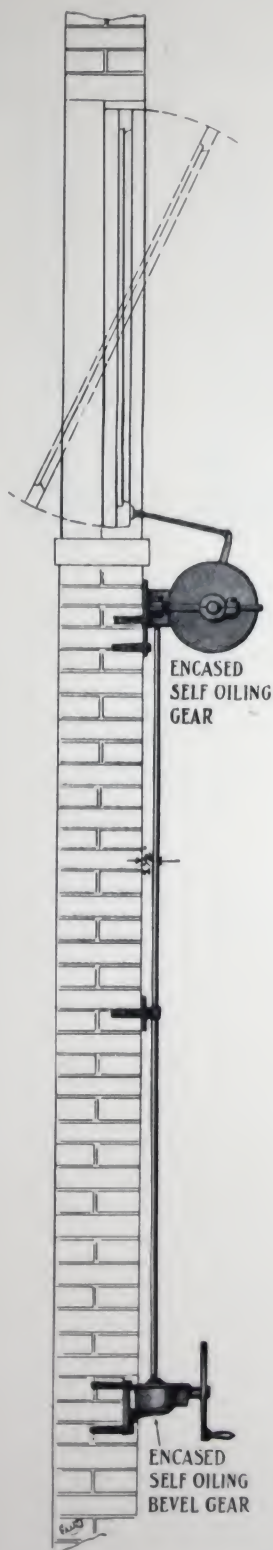
For Single Windows or very short lines of small sash we use this gear

The bolting collar and yoke are all in one, so this style can only be used when the operating rod can be continued in a line parallel or right angles to the face to which the gear is bolted. This makes a very neat machine. The gear wheel is but 6" in diameter, and the other castings in proportion. The rocking shaft is $\frac{3}{4}$ " pipe.

This also shows a method of operating the gear by means of a separate handle, a tee being placed on the end of a short operating rod, and the handle being provided with a claw to engage the tee. It can be used with any of the gears when the rocking shaft is not more than 15 ft. from the point of operation.

Price per Set, with Detachable Handle.....	\$5.00
Price per Set, with Hand Wheel.....	4.50

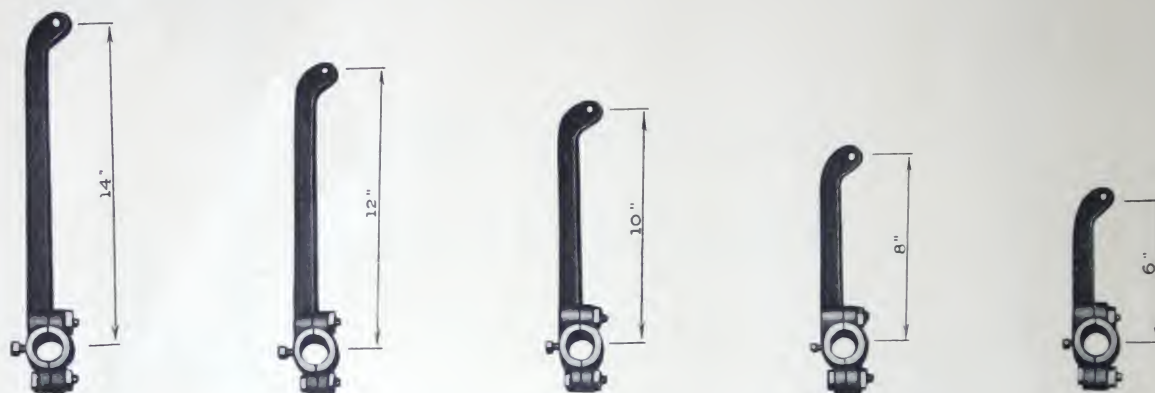
Something about Dust Proof Gears



This encased, self-oiling gear combines all the features of our other gears, together with the special advantages of being absolutely dust-proof and self-oiling.

The new Electric Power Houses of the N. Y. Central was one of our first equipments with this gear.

Arms and Rods



This plate shows the five sizes of arms usually carried in stock. They are made in two parts, thus providing for easy application and adjustment, and when bolted up they cannot slip on shaft. They are made of cast iron, are neat in appearance, and are very strong where strength is required. The rods are made of wrought steel, of suitable length for different sizes of sash, and are usually twice the length of arm.



A



B

Rod Hangers

The rod hangers are in four styles, viz.:



C



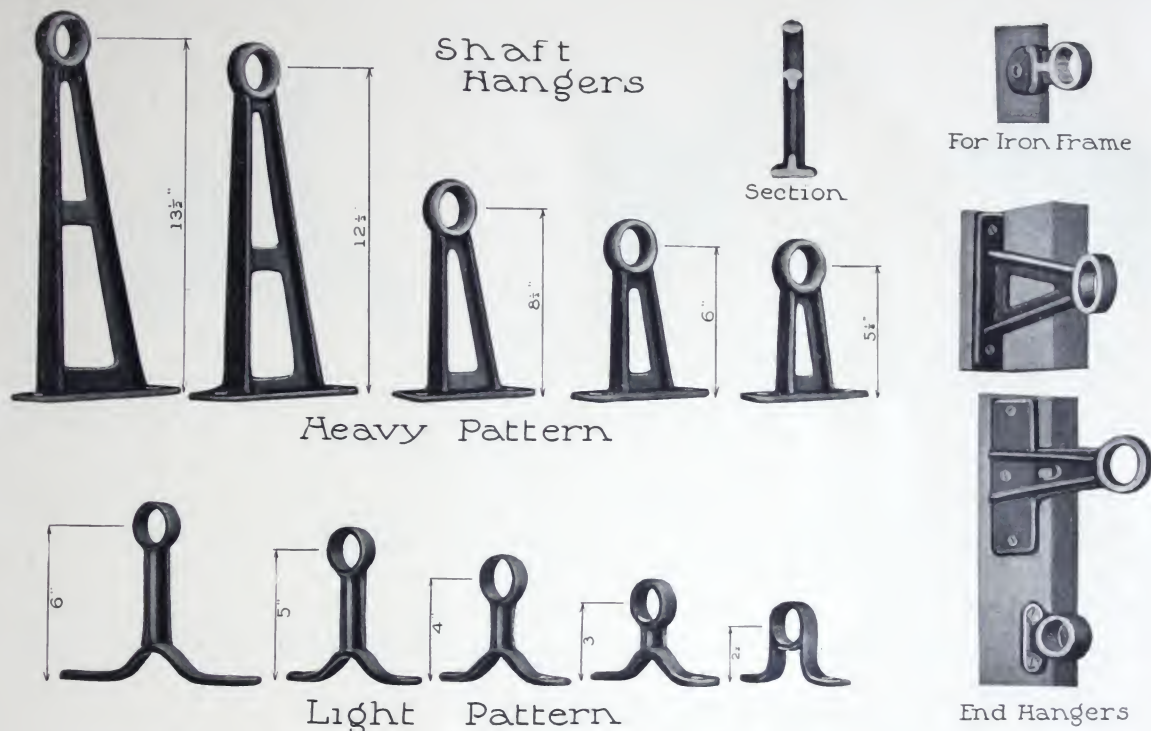
D

- A. To fasten on stiles
- B. To fasten on bottom rail
- C. To fasten on bottom rail for roof sash
- D. To fasten on narrow bottom rails

Prices per set, including arm, rod, and either style of rod hanger:

6" arm, 12" rod	35c.
8" " 16" "	40c.
10" " 20" "	45c.
12" " 24" "	50c.
14" " 28" "	55c.

Shaft Hangers



This plate shows different styles of hangers to support the rocking shaft. All are cast iron. In making the hangers we have had in mind: 1st. That the weight of the sash is carried by the worm gear direct. 2d. That the rocking shaft never makes more than one-half a turn. Therefore, there is but little friction at the bearings. These hangers are made with least possible bearing on the pipe, thus reducing the friction to a minimum. In this way they also overcome the trouble caused by the accumulation of dirt and rust. This is very important, in view of the fact that it is usually very difficult to get at the hangers after once being placed in position, thus rendering anything in the line of a bored or roller hanger impracticable.

HANGERS CAN BE SUPPLIED IN ANY LENGTH.

21½"	Heavy.....	45c.	each	6"	Light.....	20c.	each
17"	"	40c.	"	5"	"	17c.	"
13½"	"	33c.	"	4"	"	17c.	"
12½"	"	33c.	"	3"	"	15c.	"
8"	"	25c.	"	2¼"	"	15c.	"
6"	"	20c.	"	Long End Hangers.....		20c.	"
5⅛"	"	20c.	"	Short End Hangers.....		15c.	"

Iron Frame Hangers, 15c. each.

The Bevel Gears



No. 1180



No. 1135



No. 1232

This plate shows bevel gears and frame used to change direction of steel operating rod where it is desired to use the hand wheel in a vertical position.

No. 1160 shows frame for gear with base at right angle to horizontal rod.

No. 1135 shows frame with base parallel to horizontal rod.

Special frames are made where necessary.

Per set, including frame, \$2.75.

No. 1132 shows bevel gear to change direction of rocking shaft, with frame to carry same.

Per set, including frame, \$2.25.

Hand Wheels

9 inches	55c
12 "	85c



Shafting

1 inch single strength pipe shafting coupled and pinned	11c ft.
1 inch extra heavy	16c ft.
3/4 inch cold steel operating rod, with necessary couplings	10c ft.

Universal Joints



Single



Double

The single joints will work at any angle between a straight line and a deflection of 45°. They are made for both steel operating rod and line shafting. The double joint will work to an angle of 90°. They are made for operating rod only.

Single joints, 3/4" operating rod.....	\$1.10
Double " 3/4" " "	1.35
Single " line shaft.....	1.40

Universal Stands



This plate shows the different stands for supporting the operating rods where the distance from gear to point of operation exceeds ten feet. Being made in three pieces, they are universal and allow the rod to be carried in any direction.

Set of Nos. 918, 44, 45, is for general use.

Set of Nos. 822, 44, 45, to be used on round column.

Set of Nos. 1320, 44, 45, is used where necessary to carry the rod out from a post in order to clear the hand wheel.

Price, either style..... 45c. per set.

Into the Details

THE ventilating machinery here shown is the best for the purpose now on the market. The idea of this form of apparatus was originated by the late Mr. F. A. Lord, the founder of our Company, and was first applied by him for greenhouse ventilating about forty years ago. The principle, in different forms, is now used in practically all the apparatus for this purpose. There is no better way of opening and closing sashes. Long lines of sashes can be swung easily and evenly to any desired opening. It is self-locking at any point, and cannot be altered except by turning the operating rod attached to the worm, which can be done in either of the several ways shown, as may be most convenient. It is wholly mechanical, being free from chains, cables and springs, which so often get out of order. This machinery is used in conservatories and private greenhouses, churches, factories, pier sheds and armories, and for all styles of skylights. We can confidently say that it is the strongest, best finished and neatest appearing sash operating machinery made.

The apparatus consists of a rocking shaft, usually made of one inch steel tubing, supported by hangers to the framework of the building, and continuing its length. As many lines of shaft are used as there are lines of ventilators. The hangers supporting the shaft are usually placed on the muntons separating the sash, but can be placed below or above the sash, and on roofs either on the rafters or can be fastened directly to the roof boards. Different conditions govern the distance between hangers, but under ordinary circumstances they can be placed from 6 ft. to 8 ft. apart.

Arms and rods are fixed to the shaft opposite each sash, one or more to each sash according to its length, and are attached to the sash to be opened, either on rail or stiles, by means of a small cast rod hanger, different styles of which are illustrated herein, and others can be made to suit special conditions. Sash up to 4 ft. in length can be operated with one set of arms and rods to each sash, but in order to prevent racking the sash we advise the use of two sets on each sash.

The shaft is made to rock by means of a gear and worm, secured together and to the shaft by means of a yoke. The rocking shaft opens and closes the sash by means of arms and rods. When the sashes are open, their weight is carried by the rods and arms to the shaft, which is held by the gear, worm and yoke in connec-

tion with a strong bolting collar fastened to the framework of the building. This arrangement relieves the operating rod of any strain other than that necessary to turn the worm in the gear. This rod is made of $\frac{3}{4}$ -inch round cold-rolled steel shaft, and is provided with a crank or hand wheel. It can be continued down from the ridge or a monitor, following the angles or curves of the roof by means of beveled gears or universal joints. Where the sash are not more than 15 ft. from the floor line, the machinery can be operated by means of a detachable handle. The gearing can also be operated by a chain wheel and hanging chain, but we do not advise this latter method, as the chain is always more or less in the way and is much more liable to get out of order.

The rocking shafts on the various angles or sides of a building can be attached so as to operate as one shaft by means of universal joints or bevel gears. The length of a line of ventilation to be controlled by one set of gears depends upon conditions existing in each separate case. An average example would be 50 to 100 ft. of vertical sash, centre pivoted, controlled by one set of gears. This is as long a run as it is practicable to operate with any gear, in view of the fact that sufficient power must be transmitted to hold the end sash as well as the centre ones tightly closed, and to open them, even if slightly bound with ice, as is often the case.



L. I. R. R.
Power House



Monitor in Otis
Elevator Shops



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NEW YORK

